

Claims

- Claim 1. A hail resistant roof system comprising:
- a roof deck;
 - an insulation layer supported by said roof deck;
 - an energy absorbing layer supported by said insulation layer; and
 - a waterproof membrane loose laid over said energy absorbing layer.
- Claim 2. A hail resistant roof system as claimed in Claim 1 wherein said energy absorbing layer is gypsum board.
- Claim 3. A hail resistant roof system as claimed in Claim 2 wherein said gypsum board is ½ inch thick.
- Claim 4. A hail resistant roof system as claimed in Claim 1 wherein said membrane is fiberglass reinforced.
- Claim 5. A hail resistant roof system as claimed in Claim 1 wherein said membrane is about 80 mil fiberglass reinforced or thicker.
- Claim 6. A hail resistant roof system as claimed in Claim 1 wherein joints in said insulation layer are offset from joints in said energy absorbing layer.
- Claim 7. A hail resistant roof system as claimed in Claim 1 wherein said insulation is of a resilient material.
- Claim 8. A hail resistant roof system as claimed in Claim 7 wherein said resilient material is about 1.5 inches thick or more.

Claim 9. A hail resistant roof system as claimed in Claim 1 wherein said deck or substrate is air sealed.

Claim 10. A hail resistant roof system as claimed in Claim 1 wherein said membrane is air sealed to a wall structure.

Claim 11. A hail resistant roof system as claimed in Claim 1 wherein said membrane is installed with at least one intentional wrinkle to allow for gathering of membrane at hail impact depressions and to compensate for shrinkage of said membrane over time.

Claim 12. A hail resistant roof system as claimed in Claim 11 wherein said at least one wrinkle is located within a field of said membrane.

Claim 13. A hail resistant roof system as claimed in Claim 11 wherein said at least one wrinkle is located at a perimeter edge of said roof deck.

Claim 14. A hail resistant roof system as claimed in Claim 11 wherein said at least one wrinkle is located at penetrations or protrusions of said roof membrane.

Claim 15. A hail resistant roof system as claimed in Claim 11 wherein said at least one wrinkle is located at both a field of said membrane and perimeter edge of said roof deck.

Claim 16. A hail resistant roof system as claimed in Claim 11 wherein said at least one wrinkle is adhered to an underlying layer of said system with an adherent composed to yield to shear force thereon.

Claim 17. A wind blown debris resistant roof system comprising:
a roof deck;
a layer of stiff material attached to said roof deck;
a primary waterproofing membrane supported by said stiff material; and
a roof insulation and energy adsorbing layer loose laid over the primary waterproofing membrane; and
a secondary waterproofing membrane disposed over the energy adsorbing layer.

Claim 18. A hail resistant roof system comprising:
a roof deck or air sealed substrate;
a primary waterproofing membrane;
an insulation layer loose laid over primary waterproofing membrane;
an energy absorbing layer supported by said insulation layer; and
a secondary waterproof membrane loose laid over said energy absorbing layer.

Claim 19. A hail resistant roof system as claimed in Claim 18 wherein said energy absorbing layer is gypsum board.

Claim 20. A hail resistant roof system as claimed in Claim 18 wherein joints in said insulation layer are offset from joints in said energy absorbing layer.

Claim 21. A hail resistant roof system as claimed in Claim 18 wherein said insulation is of a resilient material.

Claim 22. A hail resistant roof system as claimed in Claim 1 wherein said deck is air sealed.

Claim 23. A hail resistant roof system as claimed in Claim 1 wherein said membrane is air sealed to a wall structure.

Claim 24. A hail resistant roof system as claimed in Claim 1 wherein said membrane is installed with at least one intentional wrinkle to allow for gathering of membrane at hail impact depressions and to compensate for shrinkage of said membrane over time.

Claim 25. A hail resistant roof system as claimed in Claim 24 wherein said at least one wrinkle is located within a field of said membrane.

Claim 26. A hail resistant roof system as claimed in Claim 24 wherein said at least one wrinkle is located at a perimeter edge of said roof deck.

Claim 27. A hail resistant roof system as claimed in Claim 24 wherein said at least one wrinkle is located at penetrations or protrusions of said roof membrane.

Claim 28. A hail resistant roof system as claimed in Claim 24 wherein said at least one wrinkle is located at both a field of said membrane and perimeter edge of said roof deck.

Claim 29. A hail resistant roof system as claimed in Claim 24 wherein said at least one wrinkle is adhered to an underlying layer of said system with an adherent composed to yield to shear force thereon.

Claim 30. A hail resistant roof system as claimed in Claim 1 further comprising a preexisting roof assembly that is air sealed underlying at least the energy absorbing layer.